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**"DESIGNING POWER MARKETS THAT WORK:  
MARKET IDEOLOGY AND REGULATORY REALITY"**

**CAMBRIDGE, MASSACHUSETTS  
SEPTEMBER 26, 2002**

**I. Introduction**

We are gathered this evening to commemorate the 10th anniversary of the passage of the Energy Policy Act of 1992, a key catalyst that accelerated the restructuring of our nation's electric industry.

During the debates in Congress that led to the Energy Policy Act of 1992, who would have imagined that eight years later the nation's attention would be riveted on out of control Western electricity markets that caused a political tsunami and dominated the front pages of the nation's major newspapers for over a year. Who would have imagined that both the President and Vice President of the United States would make public statements about, of all things, whether to cap the price of electricity?

When I came to the FERC more than nine years ago, it was certainly not in the public eye. Some even referred to FERC as a backwater agency. Natural gas pipeline regulation dominated the agenda. There was certainly no splash – no particular pizzaz. Little that FERC did made the front page of the *New York Times* or *Wall Street Journal*. Nothing like the lead story in the *Wall Street Journal* 10 days ago entitled "As California Starved For Energy, U.S. Businesses Had a Feast." Or consider last Tuesday's front page *New York Times* article entitled "Judge Concludes Energy Company Drove Up Prices – California is Vindicated."

Imagine, a preliminary decision by an administrative law judge of the FERC – not even a final Commission decision – was the lead story in the nation's most prestigious

newspaper, a story the editors treated as more important than the debate over war with Iraq or a below-the-fold item on bio-terrorism. What has changed here?

What has changed is a movement toward markets for the most old fashioned of products, electricity, a movement led for the most part by the FERC, an agency that thus far has proved more adept at prying open the markets and less effective

in insisting that markets all across the nation actually work for consumers. What has changed is the understanding that the way electricity is regulated touches literally every American. When that regulation works well, no one pays much attention, but an out of control market for electricity can be an economic and a political catastrophe.

But wait a minute – what does regulation have to do with markets? This is an oxymoron. Shouldn't regulators simply open the markets and get out of the way so that the market can work its magic? The first problem with this philosophy is that there are monopoly facilities at the center of the market, either natural gas pipelines or electric transmission wires. Another problem is that markets don't structure themselves and don't fix themselves – they require enforceable market rules for acceptable and unacceptable conduct, and there must be a regulatory cop on the beat. Moreover, a bad market structure for electricity, that most basic of commodities, can yield results that are so disastrous that the political establishment rejects the very idea of a market.

## **II. A Bit of History**

There were, of course, good reasons why Congress enacted the Energy Policy Act of 1992. The economic troubles of the 1980s caused electricity demand to increase slower than expected causing utilities forecasts to be wrong. And high interest rates meant high finance costs for such a capital intensive industry. In addition, some utilities had seriously underestimated the costs of their nuclear building programs. As a result, many utilities were left with quite a bit of very expensive excess capacity that they wanted ratepayers to shoulder.

But these conditions were not uniform throughout the industry. Some utilities were either smarter or luckier than others and their costs stayed lower. As a result, there were huge rate disparities among utilities, sometime even within the same region. This led to a call by large industrial users of electricity and so called transmission dependent utilities such as municipals and rural electric co-ops to reach out and buy from the cheapest supplier. Governors and members of Congress paid attention.

The electric utility industry had also seen a burst of technological innovation. Regulatory and tax incentives given to small power production in the late 1970s and

1980s proved that smaller non-utility generators could be economic and reliable. Advances in transmission technology were allowing power to be transmitted for longer distances with lower losses. The upshot to these developments meant that more sellers could provide electricity over a larger geographic market. This was a chink in the armor of the franchised local monopoly.

Finally, the 1980s had seen a renewed interest in the ideology of competition. Cost of service regulation blunted the incentives to reduce costs and innovate. The idea was that competition and the profit motive would free industry to better pursue economic efficiency. Indeed, we were indeed seeing the beginnings of success stories in restructuring some previously heavily regulated industries, such as gas, telecom, and airlines.

So these forces – economic factors, technological change, and competitive ideology – all brought to bear on the electric utility industry. Competition, it seemed, was an idea that arrived.

Specifically, the Electric Policy Act of 1992 opened the way for non-utility generation by providing exemptions from PUHCA and gave FERC the authority to order the vertically integrated utilities that controlled the transmission grid to provide access to competing generators on a case by case basis. Beyond those specific acts, EPACT provided a signal that Congress wanted the Commission to pursue a policy that would move the industry to a competitive market structure. The Commission took up the call.

I was named a Commissioner at the FERC about nine months after the enactment of EPACT, early in the Clinton administration. The Commission was in the midst of implementing Order No. 636, a comprehensive rulemaking that required all interstate natural gas pipelines to unbundle transmission services from the gas commodity and to function more or less as a common carrier. This was a major step toward efficient wholesale natural gas markets.

EPACT authorized the Commission to process petitions for electric transmission access on a case by case basis. Procedurally, it was excruciatingly slow, with plenty of opportunities for the transmitting utility to litigate key issues and otherwise to delay the proceeding. Cases moved glacially, and almost no one got access to the grid. The movement to open the grid so that customers could choose alternate suppliers seemed stymied. It was hard to believe this is what Congress intended.

At the same time, the gas pipeline restructuring was proceeding apace, wholesale gas markets and trading hubs were emerging, and customers were clearly benefitting from a choice of suppliers. In contrast, the electric grid, controlled by vertically integrated

monopolies, was still largely unavailable to facilitate customer choice, so a frustrated Commission went to work on a generic rulemaking to promote open access to our nation's electric transmission grid. The result of this effort, Order No. 888, was issued in 1996. It required 167 transmission owning utilities, roughly 70% of the interstate transmission system, to file a standard tariff offering wholesale transmission service on a non-discriminatory basis.

Although Order No. 888 was a bold move at the time, it soon became clear that more would have to be done to ensure the non-discriminatory grid access that a market requires. Order No. 888 did not require a corporate unbundling of generation from transmission, and there continued to be complaints that the vertically integrated transmission owners were denying access to competing suppliers in order to favor their own generation. Also, as grid usage patterns changed, transportation bottlenecks increased and there were regional implications. A transmission network divided among 167 corporate entities did not seem well organized to handle the needs of emerging regional power markets. Meanwhile, independent system operators had been formed in California, PJM, New York and New England. These ISOs provided a remedy for self dealing through a sharper separation of generation from transmission and, by combining the transmission assets of a number of companies, ISOs provided for grid operation on a more regional basis. The ISOs also operated transparent spot markets on a daily or hourly basis, a feature supported by the Commission.

The Commission decided to build upon this successful regional model. In December of 1999, we issued Order No. 2000, which promoted combinations of transmission assets into regional transmission organizations or RTOs. The RTO had to be completely independent of merchant interests, would manage the grid in real time and establish an organized spot market. The idea was to reorganize grid and market operations to be roughly congruent with emerging regional power markets. More than a hundred system operators would be collapsed to 8-10 more efficient and reliable system operators for the entire nation. Certainly, this was a worthy goal, but a majority of the Commission was not willing to make this a mandatory program. The Commission encouraged, but did not require, the formation of RTOs. As a result, the legacy of Order No. 2000 is mixed – a hodgepodge of proposals with some regions hastening to comply and others dragging their feet.

### **III. The California Market Debacle**

On a separate track, the California electric restructuring was proceeding apace, first through the state commission and then the state legislature. California, the fifth largest economy in the world, required its utilities to sell off most of their generation and to transfer control of grid operations to the California ISO. A separate Power Exchange

was created to match wholesale buyers and sellers in day ahead and hourly markets, yet the ISO was ultimately responsible for keeping the lights on. The market structure, with its requirement for all transactions to use the power exchange and ISO spot markets, was seriously flawed. There was little forward contracting, and plenty of opportunities for last minute arbitrage between the power exchange and ISO markets.

The market structure required FERC approval. Although serious concerns were raised in our proceedings about market design flaws, the Commission could not imagine rejecting a proposal made by the California Public Utilities Commission that had been refined by the California General Assembly and signed into law by the Governor. It was a plan designed by California for California, and the FERC approved it, relying upon notions of regional deference and cooperative federalism. Despite its flaws, until the summer of 2000 the market performed fairly well – prices seemed reasonable and supplies plentiful. Then, prices spiked disastrously and stayed very high for a full year. Power that cost California \$7 billion in 1999, cost about \$30 billion in 2000. A witches' brew of factors was blamed – over reliance on a poorly designed spot market, a low hydro year, withholding of generation, and manipulative bidding strategies that we are still investigating until this day.

The political reaction from California was shock and outrage, and as the high prices spread throughout the entire 12 state western interconnection, the outrage spread as well. Although early intervention by the FERC to limit the dollar level of the generator's bids could have put a stop to both the economic and political carnage out west, the Commission's free market ideology conflicted with an obvious need for forceful intervention to restore sanity. Unfortunately, the Commission did not step in with effective mitigation for a full year. In June of 2001, the Commission put in place bidding caps and imposed a tariff condition requiring all generators to offer their power into the market place. Prices immediately dropped and have stayed within reasonable limits, but severe damage had been done to the relationship between the FERC and the State of California as well as to the very concept of markets for electricity. If the price of electricity could quadruple in a single year, no one wanted anything to do with electricity markets. Moreover, the state was stuck with an over supply of high priced long term contracts negotiated in desperation during the crisis when there was no well functioning spot market to provide price discipline in the forward contract markets. The Commission now has before it extensive refund proceedings where billions of dollars are at issue as well as numerous complaints seeking to reform the long term contracts.

In late 2001, the collapse of Enron, the world's largest energy trader, coupled with the disclosure of the now infamous Enron trading strategies, provided fresh fuel for the raging firestorm of controversy, and raised new suspicions about the motivations of marketers and power sellers. Fat Boy, Ricochet and Get Shorty bidding strategies

appeared to be ruthless attempts to manipulate the market to maximize profits well beyond what the public interest should bear. Then came disclosures that a number of sellers and marketers had engaged in so-called wash trades, transactions that seemed to have no purpose other than to send a false price signal or artificially to pump up trading volumes. This type of funny business obviously damaged the very notion of energy trading and seriously eroded investor confidence in this business sector. Some generation and trading companies now teeter on the brink of bankruptcy.

#### **IV. Insisting on Good Markets**

This sounds like a somewhat gloomy story so far, but rays of sunshine and hope were breaking through the clouds back east. The system and market operator for the middle Atlantic states is known as PJM. The PJM market is a few thousand MW larger than the California market. It appears to operate smoothly and efficiently under a system known as locational marginal pricing with a bid based security constrained dispatch. Generators bid in day ahead and hourly markets to supply load. Both sellers and buyers seem happy, new generators are entering the market, and infrastructure improvements are being made. The PJM market structure seems very popular with the state regulators as well, and that is certainly a critically important sign. For the last five years, we have been observing as the PJM market hummed along, oblivious to the problems on the West Coast. The Commission's respect for the PJM market design has increased dramatically as we have observed its efficient operations, and PJM customers seem to be benefitting. The New York ISO has adopted an almost identical market design, and the New England ISO is now moving sharply in the same direction.

At this critical juncture, what should the Commission do? Some are urging a return to cost of service regulation. Another option is to muddle through this painfully slow evolution to good wholesale markets, yet this can lead to paralysis and perhaps even crisis. Who is to say that another California-type crisis, based upon poor market design, is not just around the corner?

We have chosen to take the steps necessary to aggressively shape good wholesale markets. Why? We know that wholesale electricity markets can work well with the right structure and set of market rules. That's point number one.

Point number two is competition can spur an investment boom. Over 60 GW of capacity was built between 1997 and 2002. Merchant transmission is entering the market as well.

Point number three is that there is the potential for considerable long term environmental benefits. Emissions of acid rain and ozone-causing chemicals are

hundreds times less with this new generation when compared to the existing fleet. Also, a good market structure paves the way for demand resources and clean distributed resources.

Point number four is our experience with the restructuring of the natural gas industry. There has been an investment boom there as well, and a restructured gas industry has saved consumers many billions of dollars. We can replicate this in electricity markets.

And point number five is this: Congress opened the door, and FERC took the ball and ran. Despite some voices in Congress wanting FERC to turn the clock back, I see no evidence that Congress as a whole wishes the Commission to reverse course and return to cost of service. True, we have a lot of selling to do on our standard market design, but my sense is that a motion in Congress to return to cost of service would be soundly defeated. My belief is that Congress would be happy if we could make markets work for consumers. Besides, more than one-third of our generation is now owned by independent companies that need grid access. Cost of service regulation in wholesale markets does not even seem practical anymore.

So the question before the Commission now is: how can we move electricity market policy forward in light of the California disaster? As with most painful episodes in history, we must learn from them. The biggest lesson from the California experience is that market design and structure is absolutely critical, and that the FERC must develop a set of national standards for markets that work and then absolutely insist that they be met. We approved a bad market design in California in a spirit of regional experimentation. In this same spirit, the FERC has allowed a hodgepodge of wholesale market designs across the country.

## **V. Standard Market Design**

We cannot continue with that permissive approach. It is not in the public's best interest. We've seen the importance of market design in electricity markets, and we've learned quite a bit about what works and what doesn't work. And there is no reason to proceed with electricity markets unless they work well for customers. So in July the Commission proposed what we've called a Standard Market Design, or SMD, for all wholesale electricity markets in the nation. The fundamental aspects of our proposal will provide the foundation of electricity markets that will perform well. The proposal heeds the lessons of California and adopts in large part basic design elements from the market here in the east that scores of academics, state policymakers and market participants, agree works well – the PJM market.

Let me describe the fundamental aspects of our SMD proposal.

First, it would put in place strong customer protections. This is absolutely critical. All market participants need to have confidence in the fairness of the market, they need protection from market failure and bad behavior, and they need a regulatory cop on the beat to protect the market when needed. We require a strong market monitoring and mitigation program. Each region would have an independent market monitor that would report directly to the Commission. There will be a \$1,000 per mwh cap on all bids into the spot markets. Bids into congested regions would face stringent caps. And we would also allow regions to implement an optional measure that would further limit bids under unusual market conditions.

The Commission also proposes a resource adequacy requirement in each market. This is designed to ensure that each load serving entity has sufficient generation or demand response resources lined up to meet needs three years in advance. Not only will this help keep the lights on, but ensuring resource adequacy will also lessen the effect of price volatility in the spot markets.

A second important aspect of the Commission's SMD proposal is that it recognizes the vital importance of a well functioning spot market. This is driven by two of the physical realities of electricity. Electricity cannot be stored economically. So supply must be dispatched to match demand instantaneously. Any imbalance will cause instability on the grid. We deal with this reality in a market environment by "fine tuning" the spot markets. There is a day ahead market where resources are bid to match expected demand. And then there is the hourly real time market.

Not only do these markets perform an essential reliability function, but also they perform an essential commercial function by disciplining bilateral forward contracts. Most market participants prefer to commit their resources and cover their customers' load in forward contracts at set prices. But the prices of the forward contracts are based on expectations of what prices in the spot markets will be. Sellers won't commit to contract at prices much below what they expect spot prices will be, and buyers won't commit to prices much above what they expect spot prices will be. Thus, the spot markets actually discipline the long term forward contract markets. Thus, a well functioning spot market is foundational. This was a critically missing feature of the California market and resulted in high spot prices. As those prices soared, load serving entities were forced into expensive forward contracts. The Commission is still dealing with the fallout.

An effective electricity spot market design must recognize electricity physics, and the Commission's SMD proposal does just that. It recognizes that energy flows along a path of least resistance and that path depends on a multitude of system conditions that

exist at the time. At times, the grid is bottlenecked, and the preferred mix of generation supply cannot reach the load. The efficient way to manage this congestion is for generators to bid and operate in ways that change the power flows. Under SMD, the real time spot, or imbalance, market will rely on a bid-based security constrained dispatch, thereby assuring the grid operator that all schedules set in the day ahead market are feasible. This was not the case in California where last minute out of market adjustments increased pressure on the real time market and raised prices.

In addition, the SMD proposal's pricing recognizes physical reality. SMD requires locational marginal prices, which recognizes that congestion can occur at various points on the grid and can mean that costs to serve load at different nodes on the network can vary. Our experience is that locational pricing provides highly accurate price signals to guide investments in generation, demand response and transmission infrastructure. Before we issued our proposal, the Commission held weeks of outreach conferences with industry stakeholders, and no one proposed a superior alternative to what the PJM market uses. Thus, I believe our proposal will result in effective spot markets that will prove difficult to game.

Third, our SMD proposal eliminates self-dealing on the grid. The transmission grid and the spot markets will be operated by a independent transmission provider, one that has no merchant interests in the market. No longer will grid access decisions be influenced by an incentive to favor a merchant affiliate. It is critical that all market participants have confidence that the grid and the spot markets are operated in a straightforward and unbiased manner. We will ensure this on a national basis.

Fourth, the proposal requires that all uses of the grid be governed by the same rules and by a single tariff. There will no longer be opportunities for discrimination between different types of transmission service. This further assures market participants of a level playing field.

And fifth, our SMD proposal vigorously promotes demand response. A robust demand response is largely absent from electricity markets, yet it is an important means of moderating prices. Fortunately, getting a level of demand response sufficient to counteract price run ups is not insurmountable. Studies indicate that we need only about 5 to 10% of demand to be effective. I believe that good market operation will require this. Demand responsiveness, when developed, can also be an important factor in determining generation and transmission adequacy and in congestion management.

These rules would have prevented the California crisis. SMD is a design based fundamentally on long term contracts disciplined by efficient spot markets.

These rules are hard to game, and I intend to insist that SMD contain sufficient customer protection provisions so that Federal, state and local policymakers can have confidence that there will be no runaway, get rich quick markets.

## **VI. Conclusion**

In conclusion, please let me take a couple of minutes for my personal reflections.

I want to commend the Harvard Electric Policy Group for dealing intelligently with these issues for almost 10 years. I have participated in many of their sessions, and have always found them to be very useful and spirited debates on the thorny issues raised by this movement to electricity markets.

I've discovered that there are no easy answers to the really tough questions that this policy evolution raises. What is the appropriate mix of regulation and free market ideology? Can we count on markets to protect consumers, or will that always be the regulator's job? How do we balance the need to spur new investment with the need for customer protections? Any policymaker in an area this complex must become comfortable dealing with a high level of ambiguity in the policy debate, where there are good arguments on virtually every side. Yet, despite the ambiguity, someone has to decide.

Having decided, a policymaker must also have the confidence and courage to change direction when the arguments to do so are persuasive.

My last nine years of service at the FERC have been filled with both exhilaration and frustration. Exhilaration when the Commission's policy choices yield consumer benefits, yet great frustration as prices skyrocketed out West and the Commission did not have the political will to intervene forcefully and early to stop the economic carnage.

We must do better. I am determined that we must and will make markets work for consumers.